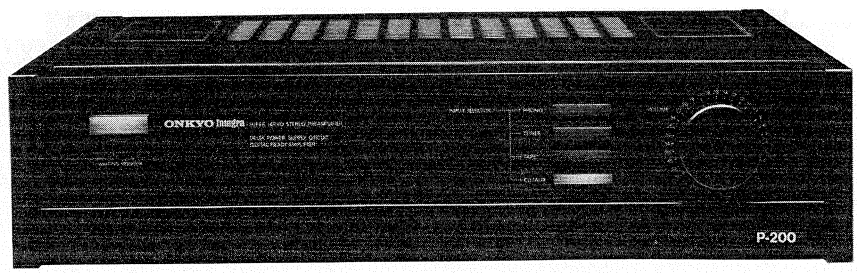
P-200

SERIAL NO. 3212

ONKYO® SERVICE MANUAL

Super Servo Stereo Preamplifier MODEL P-200



SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ ON THE SCHEMATIC DIAGRAM AND IN THE PARTS LIST ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE THESE COMPONENTS WITH ONKYO PARTS WHOSE PARTS NUMBERS APPEAR AS SHOWN IN THIS MANUAL.

MAKE LEAKAGE-CURRENT OR RESISTANCE MEASUREMENTS TO DETERMINE THAT EXPOSED PARTS ARE ACCEPTABLY INSULATED FROM THE SUPPLY CIRCUIT BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

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ONKYO®
AUDIO COMPONENTS

SPECIFICATIONS

Input Sensitivity and Impedance:	PHONO MC:	HIGH MC 2.5mV/100 ohms 130μV/(100/330) ohms
	PHONO MM:	2.5mV/(47kohms/ 100kohms)
	TUNER, TAPE PLAY, CD/AUX:	150mV/47 kohms
Rated Output and Impedance:	TAPE REC:	150mV/2.2 kohms (PHONO)
	OUTPUT:	1.5V/220 ohms Max. 13V
RIAA Deviation:	±0.2dB, 20 – 20,000Hz	
Frequency Response (TUNER, TAPE, CD/AUX):	+0, –3dB, 0.8Hz – 170kHz	
Phono Overload:	PHONO MM:	380mV RMS at 1 kHz, THD 0.05%
	PHONO MC:	19mV RMS at 1 kHz, THD 0.05%
Total Harmonic Distortion:	0.003% at PHONO MM, 3V output 0.005% at PHONO MC, 3V output 0.002% at TUNER, CD/AUX and TAPE, 3V output	
Intermodulation Distortion (AUX):	0.004% (70Hz: 7kHz = 4:1)	
Signal-to-Noise Ratio:	PHONO MC:	76dB (IHF A-202)
	PHONO MM:	82dB (IHF A-202)
	TUNER:	90dB (IHF A-202)
Tone Control (Vol. –20dB):	BASS:	±8dB at 70Hz
	TREBLE:	±8dB at 20kHz
Filters:	HIGH CUT:	(TREBLE min.): 6dB/oct, 7 kHz
	SUBSONIC:	6dB/oct, 15Hz/20Hz
Audio Muting:	–20dB	
Inputs:	PHONO 1 & 2, TAPE PLAY 1 & 2, TUNER, CD/AUX	
Outputs:	TAPE REC OUT 1 & 2	
	OUTPUT:	1 (for super servo cable) 2 (for normal cables)
Power Supply:	AC 220V, 50Hz	
Semiconductors:	71 transistors, 52 diodes, 10 FETs, 8 ICs	
Dimensions:	480(W) x 127(H) x 415(D)mm 18 57/64" x 5" x 16 11/32"	
Weight:	10.5 kg, 23.1 lbs.	

Specifications and features are subject to change without notice.

PRECAUTIONS

1. Replacing the fuses

For continued protection against risk fire, replace only with same type and same rating fuse.

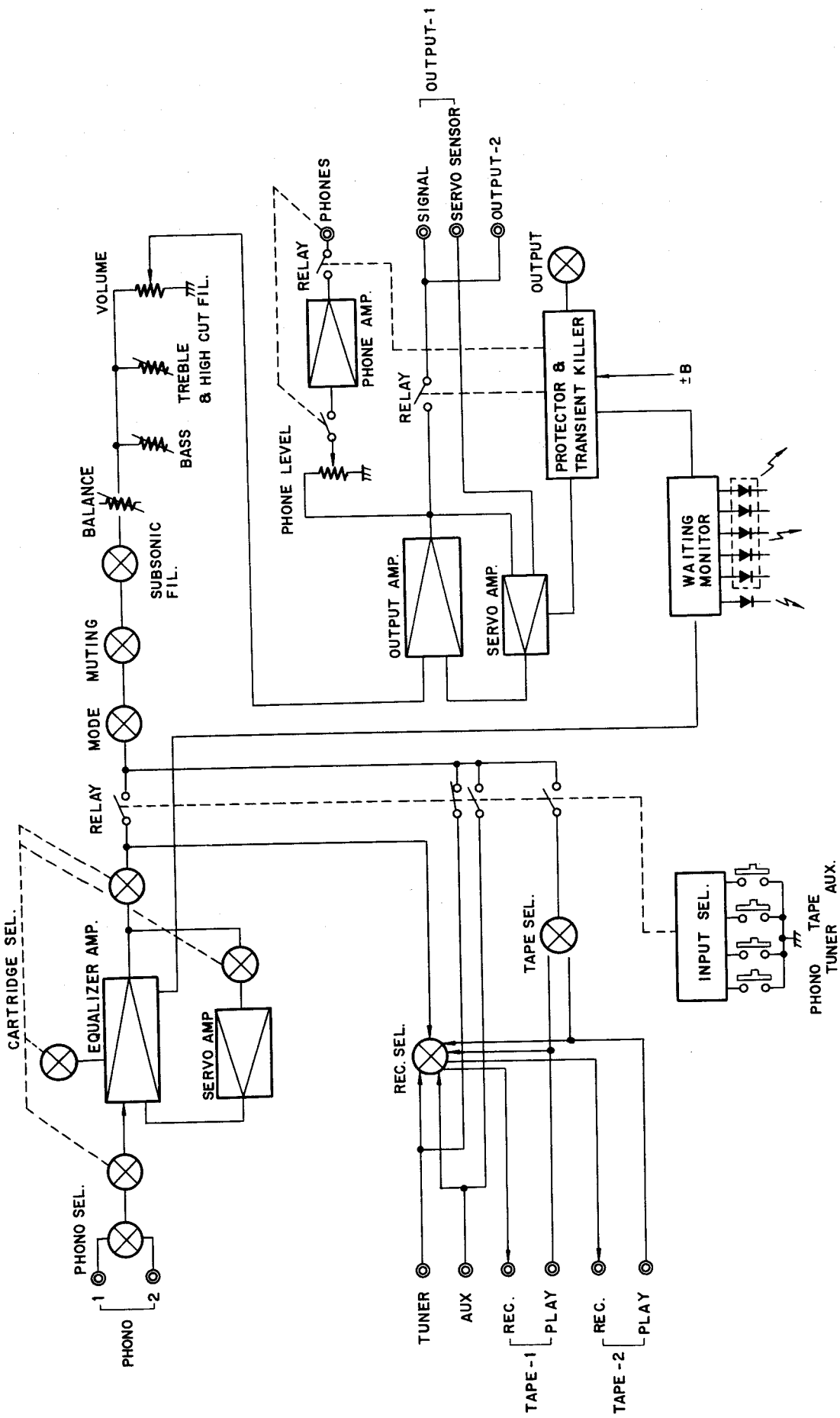
CIRCUIT NO.	PARTS NO.	DESCRIPTION
F001	252070	1A-SE-EAK, Primary fuse

2. Replacing the lamp

This unit uses the lamp listed below.

CIRCUIT NO.	PARTS NO.	DESCRIPTION
PL801 ~ PL804	210065B	PL12V 150mA
PL805		
PL806 ~ PL808	210086	PL14V 60mA–0.9
PL809 ~ PL812	2110085	PL14V 60mA–2.6

BLOCK DIAGRAM



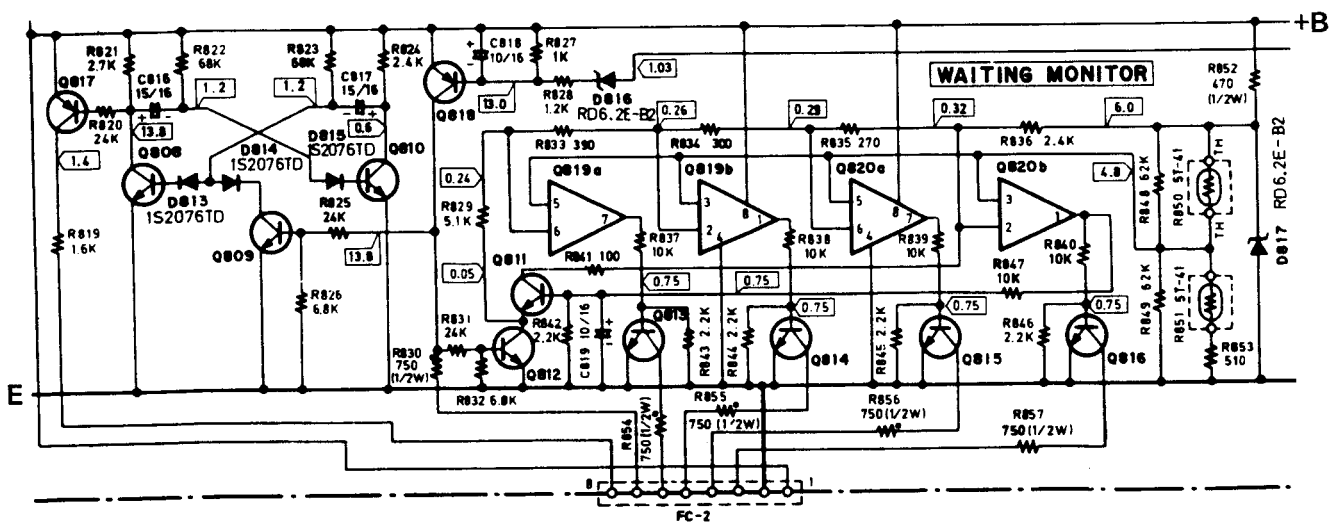
CIRCUIT DESCRIPTION

Waiting Monitor

It is a generally accepted fact that the sound quality of amplifiers is better after power has been left on for a while than it is when power is first switched on. The reason for this is that the operating points and characteristics of transistors, capacitor and other circuit components change according to the ambient temperature. This change in sound quality is unavoidable no matter how carefully an amplifier is designed. To obtain optimum sound quality, an amplifier should, therefore, be first left on for a few minutes so that the operating characteristics of internal parts are stabilized. However, the length of time needed differs depending on factors such as the amplifier's design and the room temperature. The waiting monitor on this unit is provided to show the user when the circuitry is ready to provide optimum sound quality. For the best sonic results, the unit should not be used until the entire waiting monitor is lit.

This monitor functions in the following manner. When power is switched on, LED D812 is caused to flash on and off by the signal that comes via Q817 from the astable mutivibrator consisting of Q808 and Q810. The interval during which the LED flashes on and off is the transient killer time, no sound is heard from the speakers. After about six seconds, the transient circuit operates and Q818 is switched on to stop the multivibrator, swich off D812 and switch on one LED of D811 to start the waiting monitor.

The number of D811 LEDs lit increases as the difference between the temperature of the radiator and the inside of the unit increases. These temperatures are detected by thermistors R850 and R851. When the last LED of D811 lights, Q811 operates to drop to voltage at pin 2 of Q820. This causes the LEDs of D811 to be locked in the illuminated mode.



Purpose of the Super Servo Cable

In ordinary separate pre and power amplifiers, the two amplifiers are connected using phono cables. Since the preamp does not handle the large currents that the power amp does, it is possible to hold degradations in sound quality caused by internally generated impedances to a low level. However, due to impedances that exist in the phono cables connecting the pre and power amps, contact resistances in the jacks and impedances in the internal wiring, crosstalk is introduced by the pre-power amp connection. This results in a loss of sonic resolution and realism.

By using the Super Servo cables, differences in potential between the pre and power amps can be detected and cancelled out by a feedback loop. This creates a situation that is the same as if the ground lines of both amps were directly linked. The Super Servo cable, Which has a negative servo sensor line, is included with each Onkyo preamplifier using this system. To take advantage of this ground voltage equalizing function, the pre and power amps must be connected using this cable.

ADJUSTMENTS

1. Preparations

Place the unit in the standard horizontal position, confirm that the heat vents are not blocked and leave the power on for at least ten minutes (no input signal) before performing the following adjustments.

2. Equalizer Amp and Center Voltage Adjustment and Check

(1) Connect a high sensitivity DC electronic voltmeter to the REC or OUT terminal of panel NAEQ-970a. Set the recording selector to the PHONO position.

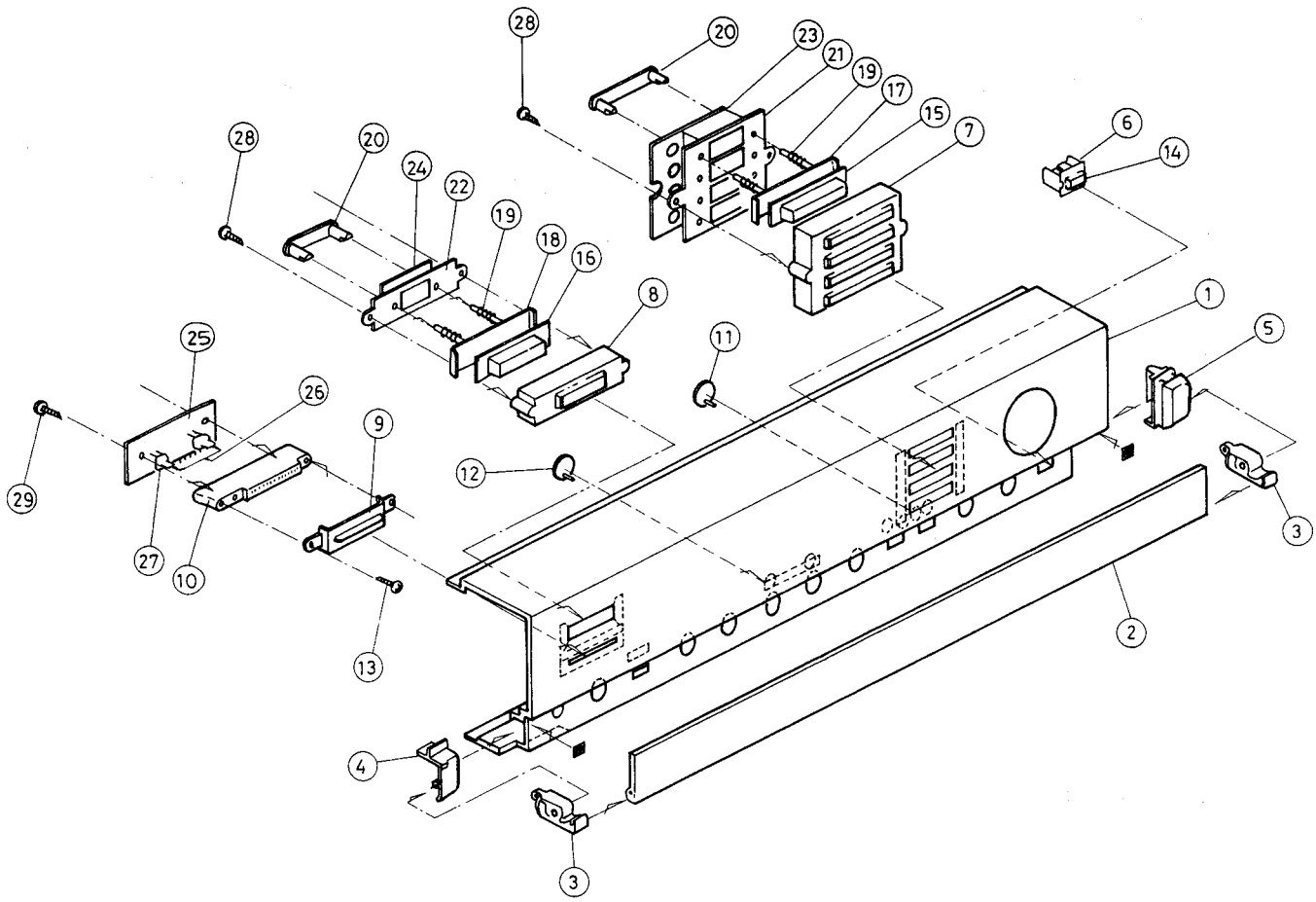
(2) Adjust the semi-fixed resistor R231 (R232) so that the voltmeter reading is 0±200 μV. (When checking, no readjustment is needed if the reading is 0±1 mV.)

3. Protection Circuit Operation Check

(1) Immediately after power is switched on by the power switch, the orange LED should flash on and off. This LED should go out after about 6 seconds and green LED on the left edge should light. Finally, confirm all of the green LEDs are lit after about 10 to 15 seconds.
When power is switched off, the relays should be switched off for an instant and all LEDs go out.

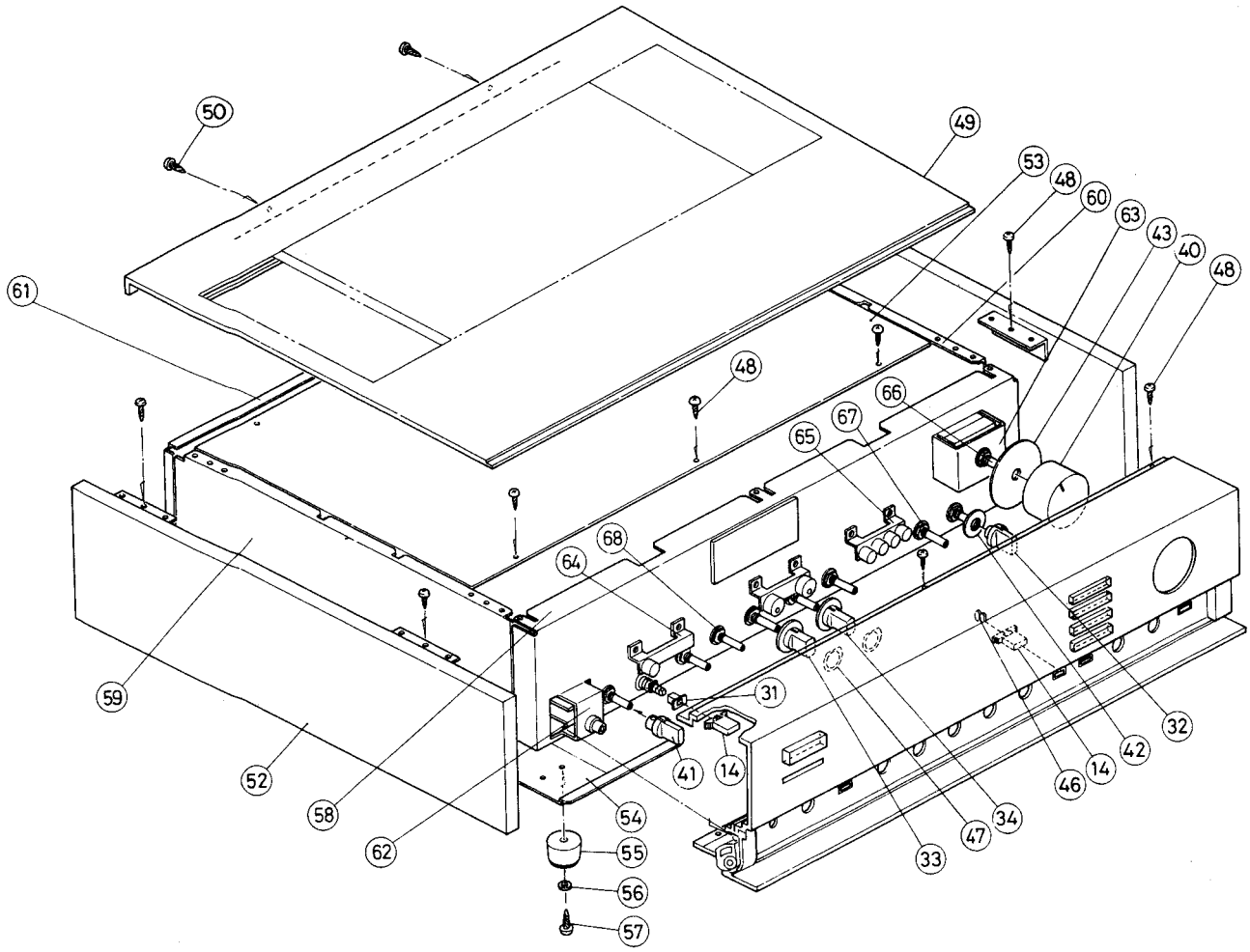
(2) When the muting switch is set to on (−20dB) and a DC +3V signal is sent to the AUX inputs, confirm that the relays are switched on in the normal manner when power is switched on.
Next, confirm that the relays are switched off for an instant when muting is switched from on to off. Apply a DC −3V signal to the AUX inputs and confirm that the relays are switched on in the normal manner.

EXPLODED VIEW



PARTS LIST

REF. NO.	PARTS NO.	DESCRIPTION
1	17868121	Front panel ass'y
	(Include 2 to 8, 11 and 12)	
2	27210332	Front panel S
2	28135106	Model plate
3	27300400A	Bearing L
3	27300399A	Bearing R
4	28125082	End cap L
5	28125083	End cap R
6	27267083	Guide, push
7	27267081	Guide, selector
8	27267080	Guide, power
9	27190090	Holder, LED
10	27267082	Guide, LED
11	28198546	Facet ass'y A
12	28198537	Facet B
13	834130102	3STS+10BQ, Tapping screw
14	28320479	Knob, push
15	28320474	Knob, selector
16	28320473	Knob, power
17	27220015A	Slider, selector
18	27220014A	Slider, power
19	27180049	Spring G
20	27220016	Slide B
21	27190089	Holder, selector
22	27190088	Holder, power
23	12791578	NAPL-978, Lamp pc board ass'y
24	12791580	NAPL-980, Lamp pc board ass'y
25	12791579	NADIS-979, Display pc board ass'y
26	225063	SLP-252B, LED (D811, D822)
27	225064	SLP-451B, LED
28	834130102	3STS+10BQ, Tapping screw
29	831130082	3STS+8BQ, Tapping screw



REF. NO.	PARTS NO.	DESCRIPTION
31	27190091	Holder, push
32	28320475	Knob, balance
33	28320477	Knob, bass
34	28320478	Knob, treble
40	28320505	Knob, volume
41	28320476	Knob, headphone
42	28140312	Cushion
43	28140206	Cushion
46	27180049	Spring G
47	28140316	Cushion
48	834430062	3STS+6BQ(BC), Tapping screw
49	28184097A	Top cover
50	834230108	3TTS+10BQ(BC), Tapping screw
51	28185145	Side panel ass'y R
52	28185143	Side panel ass'y L
(51, 52)	28185144	Side panel
(51, 52)	27140434A	Bracket
(51, 52)	85113110	Screw
53	27150124	Shilded plate
54	27170091A	Bottom board
55	27175020	Leg

REF. NO.	PARTS NO.	DESCRIPTION
56	87613008	W3 x 8F, Washer
57	834130208	3TTS+20BQ, Tapping screw
58	27110118	Front bracket
59	27115076	Side bracket L
60	27115077	Side bracket R
61	27120717A	Back panel
62	27140426	Bracket, head phone
63	27140428	Bracket, Volume
64	27140429A	Bracket, Lamp A
65	27140430A	Bracket, Lamp B
66	5104111	N40DG100KT30M, Variable resistor
67	25030177	NRSM-105-20ZV, Remote switch, operation section
68	25030178	NRSM-106-25ZV, Remote switch, operation section

PARTS LIST

SYMBOL NO.	PART NO.	DESCRIPTION	REF. NO.
A1	27110118	Front bracket	58
A2	27190063	Holder	
A3	27140426	Bracket, headphone	
A4	27140428	Bracket, volume	
A5	27140429A	Bracket, lamp A	
A6	27140430A	Bracket, lamp B	
A7	28330037	Cap	
A13	27115076	Side bracket L	59
A14	27115077	Side bracket R	60
A15	27130227	Bracket CF	
A16	27130228	Bracket CR	
A17	27130229	Bracket TR	
A18	27130230	Bracket CE	
A19	27140431	Bracket L, pcb	
A20	27140432	Bracket R, pcb	
A27	28140315	Cushion	
A28	27150124	Shielded plate	53
A31	27300380	Damper ass'y	
(A31a)	24610440	Cylinder	
(A31b)	24610450	Piston	
A37	27260041	Shaft	
A41	27120718A	Back panel	
A42	27190063	TCBS-8N, Holder	
A47	270280	SR-4K-4, Strainrelief	
A51	27300168	Terminal, speaker	
A350	27862121	Front panel ass'y	1
(A351)	27210589	Front panel S	2
(A352)	28135107	Model plate	2
(A353)	27300399A	Bearing R	3
(A354)	27300400A	Bearing L	3
(A355)	28125082	End cap L	4
(A356)	28125083	End cap R	5
(A357)	28140206	Cushion	43
(A358)	28140312	Cushion	42
(A359)	27267080A	Guid, power	8
(A360)	27267081A	Guid, selector	7
(A361)	27267083	Guid, push	6
A362	27190090	Holder, LED	9
A363	27190091	Holder, push	31
A364	27220014A	Slider, power	18
A365	27220015A	Slider, selector	17
A366	27220016	Slider, B	20
(A367)	28198537	Facet B	12
A368	27180049	Spring G	19 46
A369	28140314	Cushion	
A370	28140296	Cushion	
(A371)	28198546	Facet A	11
A373	28140316	Cushion	47
A374	834430068	3TTS+6B(BC), Tapping screw	48
A376	27180037	Spring C	
A381	28184097A	Top cover	49
A382	27270059	Spacer	
A383	28140204	Cushion	
A384	834230108	3TTS+10B(BC), Tapping screw	50
A390	28185239	Side panel ass'y L	52
(A390a)	28185241	Side panel	
(A390b)	27140434A	Bracket L	
(A390c)	85113110	M3. 1+10F, Wood screw	
A391	28185240	Side panel ass'y R	51
(A391a)	28185144	Side panel	
(A391b)	27140434A	Bracket L	
(A391c)	85113110	M3. 1+10F, Wood screw	
A601	27170091A	Bottom board	54
A602	27175020	Leg	55
A603	834130208	3TTS+20B, Tapping screw	57
A605	87613008	W3 x 8F, Washer	56
A801	28320505	Knob, volume	40
A802	28320473	Knob, power	16
A803	28320474	Knob, selector	15
A804	28320475	Knob, balance	32
A805	28320476	Knob, headphone	41
A806	28320477	Knob, bass	33
A807	28320478	Knob, treble	34
A808	28320479	Knob, push	14
C001, C002 ⚠	3500065A	0.01μF, AC400V/ 125V, Capacitor IS	
C001a	27300080	Cover, capacitor	
F001 ⚠	252070	1A-SE-EAK, Fuse	
F001a ⚠	25065096	NPF-073, Fuse holder	
F001b	29360398	T1A/250V, Fuse Label	
P002 ⚠	253127 or	AS-CEE, Power supply cable or	
⚠	253129	AS-CEE, Power supply cable	
	2000156	NSAS-5P039, Socket	
	2000157	NSAS-8P040, Socket	
P3 ⚠	25108005	Lug Terminal	
R001	5104111	N40DG100KT30M, Variable resistor	
S001 ⚠	25035289	NPS-111-L255P, Power switch	
S101c	25035227	NPS-122-L191, Remote switch, operation section	
S101b	25065112	Remote switch, wire section	
S102c	25030177	NRSM-104-20ZV, Remote switch, operation section	
S102b	25065143	Remote swtich, wire section	
S302c	25030178	NRSM-106-25ZV, Remote switch, operation section	
S302b	25065144	Remote switch, wire section	
S306	25035108	NPS-122-L73, Push switch	
T001 ⚠	230635	NPT-721G, Power transformer	
U1	17864569A	NAPJ-969a, Source input and rec. output terminal pc board ass'y	
U2	17864570A	NAEQ-970a, Equalizer amplifier pc board ass'y	
U3	12791571	NATC-971, Tone control circuit pc board ass'y	
U4	12791572	NASW-972, Muting/subsonic filter switch pc board ass'y	
U5	17864573A	NAOP-973a, Flat amplifier pc board ass'y	
U6	17864574A	NAPJ-974a, Output terminal pc	

SYMBOL NO.	PART NO.	DESCRIPTION	REF. NO.
		board ass'y	
U7	12791575	NAHP-975, Headphone amplifier pc board ass'y	
U8	12791576	NADIS-976, Waiting monitor pc board ass'y	
U9	12791577	NASW-977, Input selector pc board ass'y	
U10	12791578	NAPL-978, Source selector lamp pc board ass'y	23

SYMBOL NO.	PART NO.	DESCRIPTION	REF. NO.
U11	12791579	NADIS-979, Waiting lamp pc board ass'y	25
U12	12791580	NAPL-980, Power lamp pc board ass'y	24
U13	12791581	NAWT-981, Indicator lamp terminal pc board ass'y	

NOTE: THE COMPONENTS IDENTIFIED BY MARK ⚠ ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK . REPLACE ONLY WITH PARTS NUMBER SPECIFIED.

PRINTED CIRCUIT BOARD–PARTS LIST

SOURCE INPUT AND RECORDING OUTPUT TERMINAL PC BOARD (NAPJ-969a)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
	Diodes	
D802~D804	223145	1S2076TD
	Resistors	
R301~R304	441622224	2.2 kΩ, 1W, Metal oxide film
	Coils	
L591~L594	230904	B-20L-44
L501, L502	231030	NCH-1070
	Switches	
S101a, S301a	25065111	NSS-4257, Phono/Tape
S302a	25065079	NSS-4643, Rec. relaies
	Relays	
RL302~RL304	25065145	NRL-2PO. 3ADC9-01
	Terminal	
	25045065	NPJ-4PDBL32

EQUALIZER AMPLIFIER PC BOARD (NAEQ-970a)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
	Transistors	
Q101~Q104	2211530	2SK146, F.E.T
Q105~Q108	2211895	2SC1815 L (GR)
Q109, Q110	2211732 or 2211733	2SC1845(F) or 2SC1845(E)
Q111, Q112	2211371 or 2211372	2SC2259(0-001) or 2SC2259(0-002)
Q113, Q114	2211585 or 2211586	2SA979(F) or 2SA979(G)
Q115, Q116	2211445 or 2211446	2SC2291(F) or 2SC2291(G)
Q117, Q118	2211732 or 2211733	2SC1845(F) or 2SC1845(E)
Q119, Q120	2211792 or 2211793	2SA992(F) or 2SA992(E)
Q121, Q122	2200744	2SD526(Y)
Q123, Q124	2200413	2SB596(Y)
Q201, Q202	2211515 or 2211516	2SA995(F) or 2SA995(G)
Q203~Q206	2211895	2SC1815 L (GR)
Q901, Q902	2211254 or 2211255	2SC1815(Y) or 2SC1815(GR)
Q903, Q904	2211454 or 2211455	2SA1015(Y) or 2SA1015(GR)
Q905	2201073 or 2201074	2SD880(O) or 2SD880(Y)
Q906	2201243 or 2201244	2SB834(O) or 2SB834(Y)
Q907, Q909	2211732 or 2211733	2SC1845(F) or 2SC1845(E)
Q908, Q910	2211792 or 2211793	2SA992(F) or 2SA992(E)
Q911, Q912	2211945	2SK246(GR), F.E.T
	ICs	
Q207, Q208	222502	NJM4558DX
	Diodes	
D101~D104	223145	1S2076TD
D105, D106	4000068	VD1222
D201~D204	223145	1S2076TD
D801	223145	1S2076TD
D901~D904	2239753	RD22E-B3
D905, D906	223848	GP08B
D907, D908	2239492	RD6. 2E-B2
	Capacitors	
C103, C104	372122214	220 pF, 50V, Styrene
C109, C110	39122725	2700 pF, 50V, DEW
C115, C116	379224731	0.047μF, 50V, DEW
C117, C118	379224331	0.043μF, 50V, DEW
C119, C120	379121225	1200 pF, 50V, DEW
C121, C122	379121824	1800 pF, 50V, DEW
C125, C126	379121037	0.01μF, 50V, DEW
C201, C202	379223641	0.36μF, 50V, DEW
C203, C204	379221057	1μF, 50V, DEW
C205~C208	352752219	220μF, 25V, Elect.
C209, C210	372121004	100 pF, 50V, Styrene
C533~C536	379123325	3300 pF, 50V, DEW
C901~C904	352780109	1μF, 50V, Elect.
C905~C908	352751019	100μF, 25V, Elect.
C909, C910	391083317	330μF, 50V, Elect.
C911, C912	352780229	2.2μF, 50V, Elect.
C913, C914	352741019	100μF, 16V, Elect.
	Resistors	
R101, R102	441629134	91kΩ, 1W, Metal oxide film
R103, R104	441621014	100Ω, 1W, Metal oxide film
R105, R106	441622214	220Ω, 1W, Metal oxide film
R107, R108	441621014	100Ω, 1W, Metal oxide film
R111, R112, R810	441621004	10Ω, 1W, Metal oxide film
R113, R114	441621044	100kΩ, 1W, Metal oxide film
R121~R124	441522024KF	2kΩ, 1/2W, Metal oxide film
R217, R128	441728214KF	820Ω 2W, Metal oxide film
R129, R130	441523314	330Ω, 1/2W, Metal oxide film
R141, R142	441620334	3.3kΩ, 1W, Metal oxide film
R145, R146	441623333	33kΩ, 1W, Metal oxide film
R147, R148	441622224	2.2kΩ, 1W, Metal oxide film
R165, R166	441623924	3.9kΩ, 1W, Metal oxide film
R167~R170	441520334KF	3.3Ω, 1/2W, Metal oxide film
R207~R210	441523924	3.9kΩ, 1/2W, Metal oxide film
R213, R124	441622013	200Ω, 1W, Metal oxide film
R215, R216	441621004	10Ω, 1W, Metal oxide film
R231, R232	5225070	N10HR2. 2KBDM, Semi-fixed
R237, R238	441521824	1.8kΩ, Metal oxide film
R850	4000074-1	ST-41(ONK), Thermistor
R901~R904	441521024KF	1kΩ, 1/2W, Metal oxide film
R905~R908	441523624KF	3.6kΩ, 1/2W, Metal oxide film
	Switch	
S102a	25065101	NSS-10652, Cartridge
	Relay	
RL301	25065145	NRL-2PO. 3ADC9-01
	Buss	
	25060031B	P-2
	25060034A	P-4
	Radiators	
	27160086	P-1
	27160087	P-2
	27160079	
	Casises	
	27300152	
	Etc.	
	223018	AC316, Accessary, Transistor
	223019	AC229, Accessary, Transistor
	27140815	Bracket, Transistor

TONE CONTROL CIRCUIT PC BOARD (NATC-971)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
	Capacitors	
C305, C306	379121235	0.012μF, 50V, DEW
C307, C308	379126244	6200 pF, 50V, DEW
C309, C310	374129114	910 pF, 50V, DEW
C311, C312	379123335	0.033μF, 50V, DEW
	Variable Resistors	
R305, R306	441625624	5.6kΩ, 1W, Metal oxide film
R313	5104110	N27DGLC250KMN25M, Balance
R315	5104108	N27DQL11C110k180k25M, Bass control
R319	5104109	N27DGL11C219K25M, Treble control
	Switch	
S303	25030175	NRSM-145-25ZV, Mode

MUTING/SUBSONIC FILTER CIRCUIT PC BOARD (NATC-972)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
	Capacitors	
C301, C302	379226835	0.068μF, 50V, DEW
C303, C304	379221545	0.15μF, 50V, DEW
	Switches	
S304	25035316	NPS-122-L280, Muting
S305	25030176	NRSM-143-25ZV, Subsonic

FLAT AMPLIFIER CIRCUIT PC BOARD (NAOP-973a)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
	Transistors	
Q301, Q302	2211915 or 2211916	2SK240(GR) or 2SK240(BL), F.E.T
Q303~Q306	2211255	2SC1815(GR)
Q307, Q308	2211140	2SA798(0-001)
Q309, Q310	2211445 or 2211446	2SC2291(F) or 2SC2291(G)
Q311, Q312	2211255	2SC1815(GR)
Q313, Q314	2211455	2SA1015(GR)
Q701	2211455	2SA1015(GR)
Q702, Q703	2211255	2SC1815(GR)
Q704	2211771 or 2211772	2SC2001(K) or 2SC2001(L)
Q913	2211414	2SC1627(Y)
Q914	2211424	2SA817(Y)
Q915, Q916	2211945	2SK246(GR)
	ICs	
Q315, Q316	222585	NJM-4558DXB
	Diodes	
D301, D302	4000068	VD1222
D303~D306	223145	1S2076TD
D307, D308	2239633	RD12E-B3
D701, D703	223145	1S2076TD
D705, D706	223145	1S2076TD
D913, D914	2239753	RD22E-B3
D915	223867	WL02
D916	223862	WL01
D917	223875	KBPC604
D918~D921	223804	SR1K-2
	Capacitors	
C313, C314	372126805	68 pF, 50V, Styrene
C315, C316	379121047	0.1μF, 50V, DEW
C317, C318	379121035	0.01μF, 50V, DEW
C327, C328	379121037	0.01μF, 50V, DEW
C331, C332	372121014	100pF, 50V, Styrene
C333~C336	352752209	22μF, 25V, Elect.
C339~C342	379124737	0.047μF, 50V, DEW
C591	379121025	1000 pF, 50V, DEW
C701	352744709	47μF, 16V, Elect.
C702	352734709	47μF, 6.3V, Elect.
C923, C924	352754719	470μF, 25V, Elect.
C925, C926	352751019	100μF, 25V, Elect.
C927, C928	3504150	3,300μF, 63V, Elect.
C929, C930	352764719	470μF, 35V, Elect.
C931, C932	352742229	2,200μF, 16V, Elect.
C934, C935	384171037	0.01μF, 630V, DT
C937	379134747	0.47μF, 100V, DEW
	Resistors	
R329, R330	441621024	1kΩ, 1W, Metal oxide film
R345, R346	441621124	1.1kΩ, 1W, Metal oxide film
R347~R350	441621134	11kΩ, 1W, Metal oxide film
R361~R364	441521014KF	100Ω, 1/2W, Metal oxide film
R367, R368	441622214	220Ω, 1W, Metal oxide film
R711	441521204KF	12Ω, 1/2W, Metal oxide film
R923, R924	441523304KF	33Ω, 1/2W, Metal oxide film
R926	441525104	51Ω, 1/2W, Metal oxide film
	Relay	
RL701	25065139	NRL-2PO. 3ADC12-05
	Casises	
	27300342	A
	27300343	B
	27300152	
	Buss	
	25060031B	P-2
	25060032B	P-3

OUTPUT TERMINAL PC BOARD (NAPJ-974a)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
	Terminals	
	25045065	NPJ-4PDBL32
	25045080	NPJ-2PDBL40

HEADPHONE AMPLIFIER PC BOARD (NAHP-975)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
	ICs	
Q401	222543	LA4170
	Diodes	
D401	223848	GP08B
D402	223145	1S2076TD
	Capacitors	
C401, C402	352731009	10μF, 10V, Elect.
C403, C404	392850477	4.7μF, 25V, Elect.
C405	352743309	33μF, 16V, Elect.
C407, C408	392851017	100μF, 25V, Elect.
C409, C410	379124737	0.047μF, 50V, DEW
C411	350415 6	1,000μF, 16V, Elect.
	Resistors	
R401	514805 5	N16RGM100KB25M, Variable, Headphone level resistor
R405, R406	441523 904	39Ω, 1/2W, Metal oxide film
R407	441521 004KF	10Ω, 1/2W, Metal oxide film
	Relay	
RL401	250651 39	NRL-2PO. 3ADC12-05, Relay
	Jack	
	250450 79	M-1658-MA, Stereo headphone jack

WAITING MONITOR INDICATOR CIRCUIT PC BOARD (NADIS-976)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
	ICs	
Q801	222685	TC9135P
Q819, Q820	222465	NJM-4558D
	Transistors	
Q802~Q805	2211771 or 2211772	2SC2001(K) or 2SC2001(L)
Q808~Q816	2211255	2SC1815(GR)
Q822, Q818	2211455	2SA1015(GR)
Q822~Q825	2212600	DTA124ES
	Diodes	
D813~D815	223145	1S2076TD
D816, D817	2239492	RD6. 2E-B2
D818	223145	1S2076TD
	Capcitors	
C816, C817	352741509	15μF, 16V, Elect.
C818, C819	352741009	10μF, 16V, Elect.
C820	352780109	1μF, 50V, Elect.
	Resistors	
R806	441722404KF	24Ω, 2W, Metal oxide film
R830	441527514KF	750Ω, 1/2W, Metal oxide film
R851	4000074-1	5T-41(ONK), Themistor
R852	441524714KF	470Ω, 1/2W, Metal oxide film
R854~R857	441527514KF	750Ω, 1/2W, Metal oxide film
	Plugs	
	25065055	NPLG-5P11
	25065070	NPLG-8P15

INPUT SELECTOR PC BOARD (NASW-977)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
S307~S310	25035156	NPS-111-S120, Aux/Tape/ Phono/Tuner selector switch

SOURCE SELECTOR LAMP PC BOARD (NAPL-978)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
PL801~PL804	210065B	PL12V150mA, Lamp
	2000156	NSAS-5P039, Socket
	27190089	Holder, selector

WAITING MONITOR LAMP PC BOARD (NAPL-979)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
D811	225063	SLP-252B, L.E.D.
D812	225064	SLP-451B, L.E.D.
	2000157	NSAS-8P040, Socket
	27267082	Guide

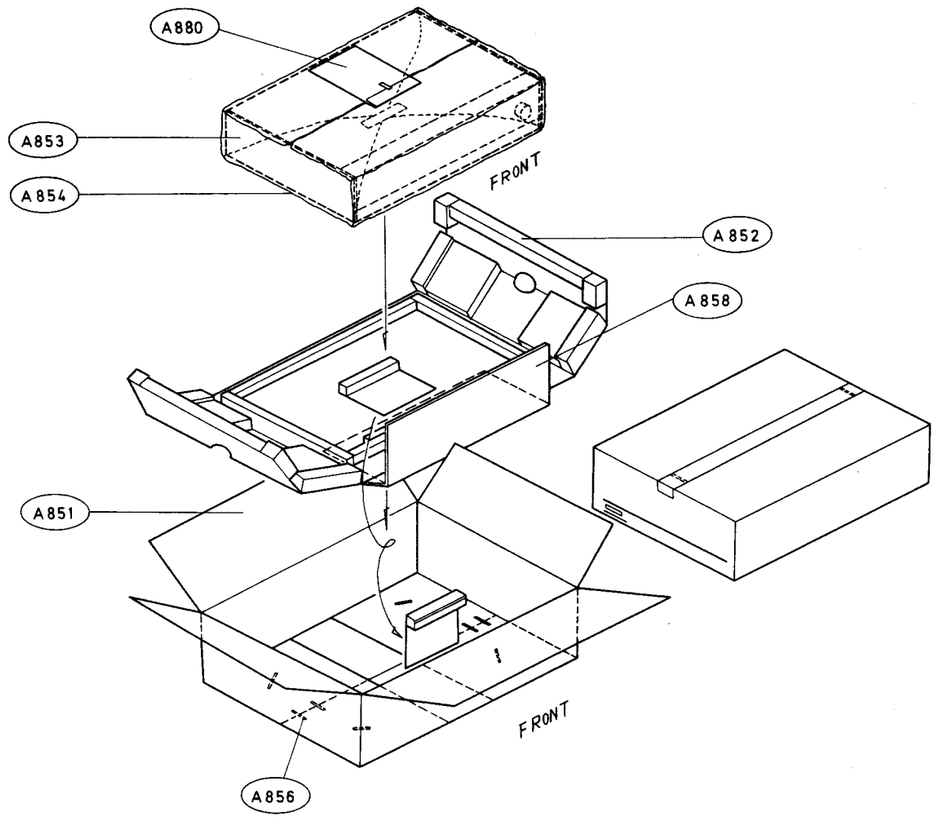
POWER LAMP PC BOARD (NAPL-980)

CIRCUIT NO.	PARTS NO.	DESCRIPTION
PL805	210065B	PL12V, 150mA, Lamp
R801	441623304	33Ω, 1W, Metal oxide film resistor
	27190088	Holder, power

INDICATOR LAMP TERMINAL PC BOARD (NAWT-981)

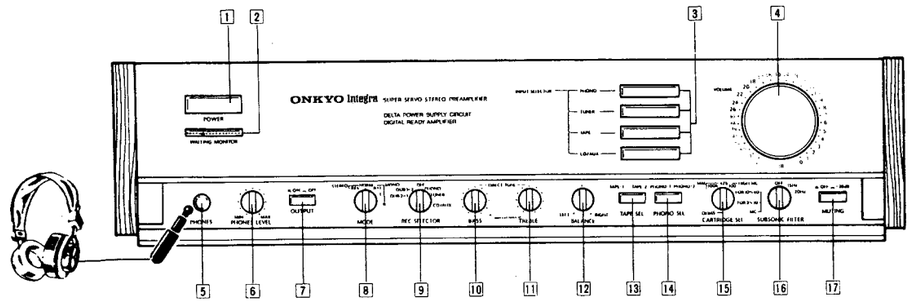
CIRCUIT NO.	PARTS NO.	DESCRIPTION
	Lamps	
PL806~PL808	210086	PL14V60mAW-0.9
PL809~PL812	2110085	PL14V60mAW-2.6
	Resistors	
R858	441521014KF	100Ω, 1/2W, Metal oxide film
R859, R860	441526804KF	68Ω, 1/2W, Metal oxide film
R861, R862	441528204KF	82Ω, 1/2W, Metal oxide film

PACKING PROCEDURES



REF. NO.	PART NO.	DESCRIPTION
A851	29051125	Master carton box
A852	29090648	Pad
A853	29095394	Protection sheet
A854	29100038	950 x 720mm, Poly-vinyl bag
A856	282301	Sealing hook
A858	29095165	Sheet F
A880	Accessary bag ass'y	
	29340880	Instruction manual
	29365016	Warranty card
	2010068	Connection cable
	2910000	250 x 350mm, Poly-vinyl bag for accessary

FRONT PANEL FACILITIES



1 Power Switch

Press to turn power on. The switch is illuminated in a gentle blue and the waiting monitor 2 flashes on and off with an orange light to show that the transient killer is operating. No should is heard during this time.

2 Waiting Monitor

This monitor shows the status of the P-200 as it warms up to the normal operating temperature. Operation is possible when the waiting monitor changes from orange to green a few moments after the power has been turned on. However, optimum operating status is not reached until all of the waiting monitor lamps have come on. Note that no sound is heard while the monitor is flashing on and off (orange color) because the transient killer is operating.

Note: The P-200 has protective circuitry that detects DC voltages and excessive currents. The waiting monitor also flashes on and off (orange color) when this circuitry has been activated.

3 Input Selector Switches

Use these switches to select the auido source. The pressed switch lights blue to show which source has been selected. The TUNER switch is always aotivated when power is first turned on.

PHONO: For listening to phonograph records. Note that it is also necessary to set the cartridge selector 15 and phono selector 14 to the proper positions.

TUNER: Press this switch to listen to the tuner.

TAPE: Press this switch to listen to one of the tape decks. The tape selector 13 must also be set to the position corresponding to the tape deck you want to use.

CD/AUX: Press this switch to listen to the component connected to the rear panel CD/AUX terminals.

4 Volume Control

The volume control is marked in decibels so output voltage and headphone volume can be read off directly in dB. The volume control is linked to the tone control circuitry.

5 Headphones Jack

Insert a standard stereo headphones plug into this jack and adjust the volume using the volume control 4 and the headphone level control 6 .

6 Headphone Level Control

The P-200 incorporates a separate headphone amplifier so the headphone volume can be raised and lowered by this control without affecting the volume level of the speakers set by the volume control 4 .

Setting Headphones Volume

The headphones volume can be changed by both the volume control 4 and the headphone level control 6 . Because headphone efficiency varies from model to model, you should first set the headphone level control 6 so that the headphones volume is the same as the level at which you would normally listen to music from the speakers. Perform all further volume adjustments using the volume control 4 .

7 Output Switch

Depress this switch to the OFF (▬) position to turn off the output from the rear panel output terminals. The orange indicator above the switch lights to show when the OFF mode has been selected. This switch should normally be left in the ON (■) position. Use the off position when you want to listen using only the headphones.

8 Mode Selector

REV: Left and right channel signals are reversed.

NORM: Use this position for normal stereo reproduction.

R+L: Right and left channel signals are mixed, and the same composite signal is sent to both speakers. This mode is used for monaural listening and to check left and right balance.

L, R: In the L setting, the left channel input signal is sent to both output terminals. In the R setting, the right channel input signal is sent to both output terminals.

9 Recording Source Selector

2▲1 Use for tape dubbing. For details, refer

1▲2 to the section on tape dubbing.

OFF: Leave in this position when not performing tape recording or dubbing.

PHONO: For recording from the turntable.

TUNER: For recording from the tuner

CD/AUX: For recording from the audio source connected to the rear panel CD/AUX input terminals.

10 Bass Control

Turn to the right of the center 0 mark to emphasize bass and turn to the left to attenuate bass according to the listening room acoustics. The lamp above the bass control shows the operational status.

11 Treble Control

Turn to the right of the center 0 mark to emphasize treble and turn to the left to attenuate treble according to the listening room acoustics. When the treble control is turned all the way to the left (–10), it operates as a 7 kHz high cut filter. Use this position when you want to suppress annoying high frequency noise such as static and tape hiss. The lamp above the treble control shows the operational status.

12 Balance Control

The sound image is shifted to the right when turned right and to the left when turned left. The left and right output levels are equal when set to the center position.

13 Tape Selector

This selector switches between the TAPE-1 and TAPE-2 input terminals on the rear panel. In the OUT (■) position, the deck connected to the TAPE-1 terminals is heard. In the IN (▬) position, the deck connected to the TAPE-2 terminals is heard. The lamp above this selector shows which position has been selected.

14 Phono Selector

This selector switches between the PHONO-1 and PHONO-2 input terminals on the rear panel. In the OUT (■) position, the turntable connected to the PHONO-1 terminals is heard. In the IN (▬) position, the turntable connected to the PHONO-2 terminals is heard. The lamp above this selector shows which position has been selected.

15 Cartridge Selector

Switch this selector to match the type of phono cartridge being used. Because a sudden increase in volume level may occur when switching this selector, always turn the volume coantrol 4 all the way down before switching to a different position.

MM: When using an MM type cartridge, switch to either of the MM positions depending on the cartridge impedance. If the impedance is not specified, switch to the 47 kohms position.

HIGH MC: Some MC cartridges produce an output voltage of about the same level as MM cartridges. This position is recommended when using such cartridges.

MC: When using an MC type cartridge, switch to either of the MC positions depending on the cartridge impedance. Use the setting that covers the cartridge impedance (3 – 10 ohms, 10 – 40 ohms) or is closest to it. However, if a step-up transformer is used, switch to either of the MM positions.

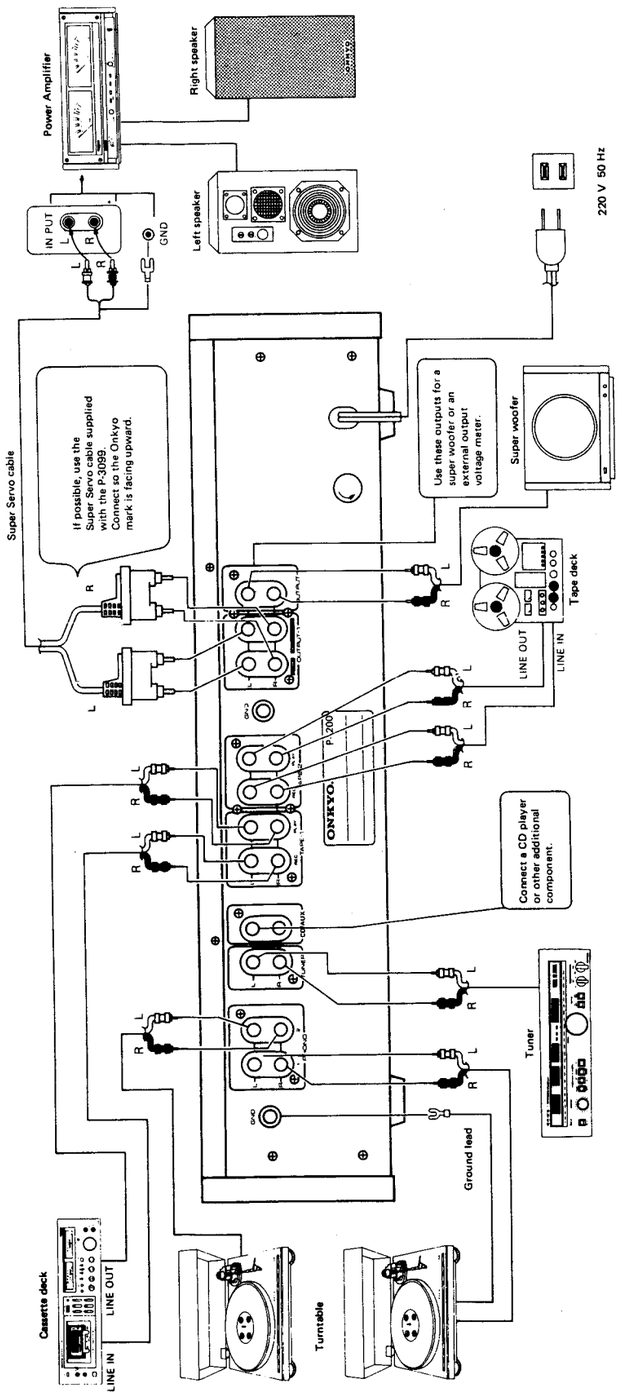
16 Subsonic Filter Switch

Use this switch to suppress unwanted low frequencies generated by record warps and motor rumble. Frequencies below 15 Hz are cut when set to the 15 Hz position while frequencies below 20 Hz are cut when set to the 20 Hz position. However since both of these positions insert a capacitor in the signal path, the effect of the Super Servo system will be reduced. It is therefore recommended that the OFF position be used as much as possible to ensure optimum sound quality.

17 Muting Switch

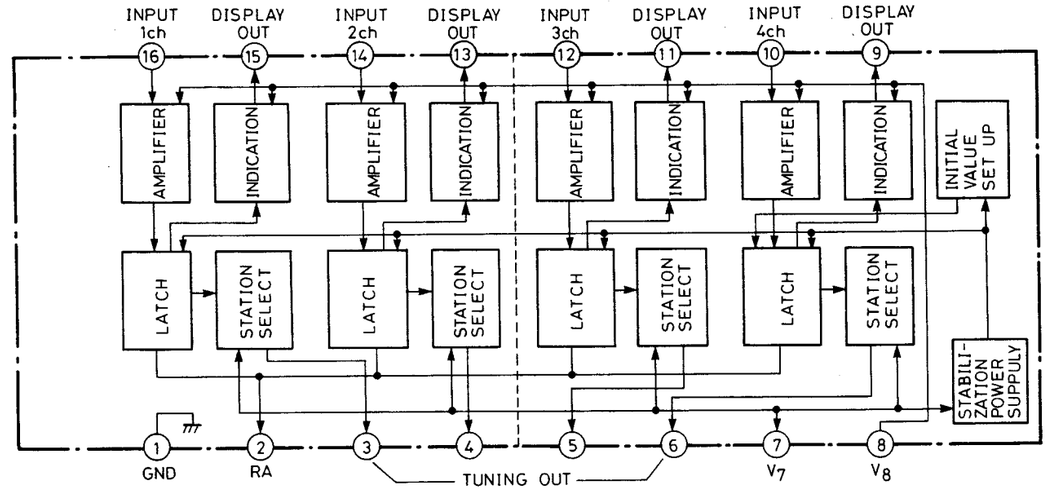
When this switch is depressed to the –20dB position (▬), the output level is reduced to 1/10th of the level set by the volume control. This muting function is convenient for temporary reduction of volume level and to eliminate unpleasant noises generated When, for example, the stylus is lowered onto a record.

SYSTEM CONNECTIONS

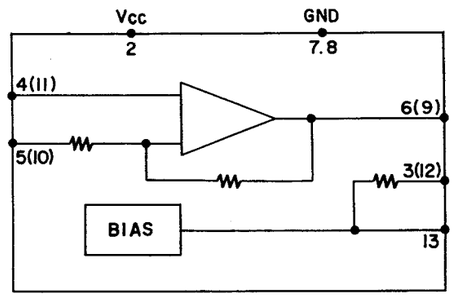


IC BLOCK DIAGRAM

HA1194

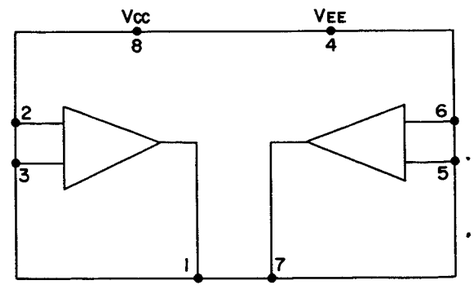


LA-4170



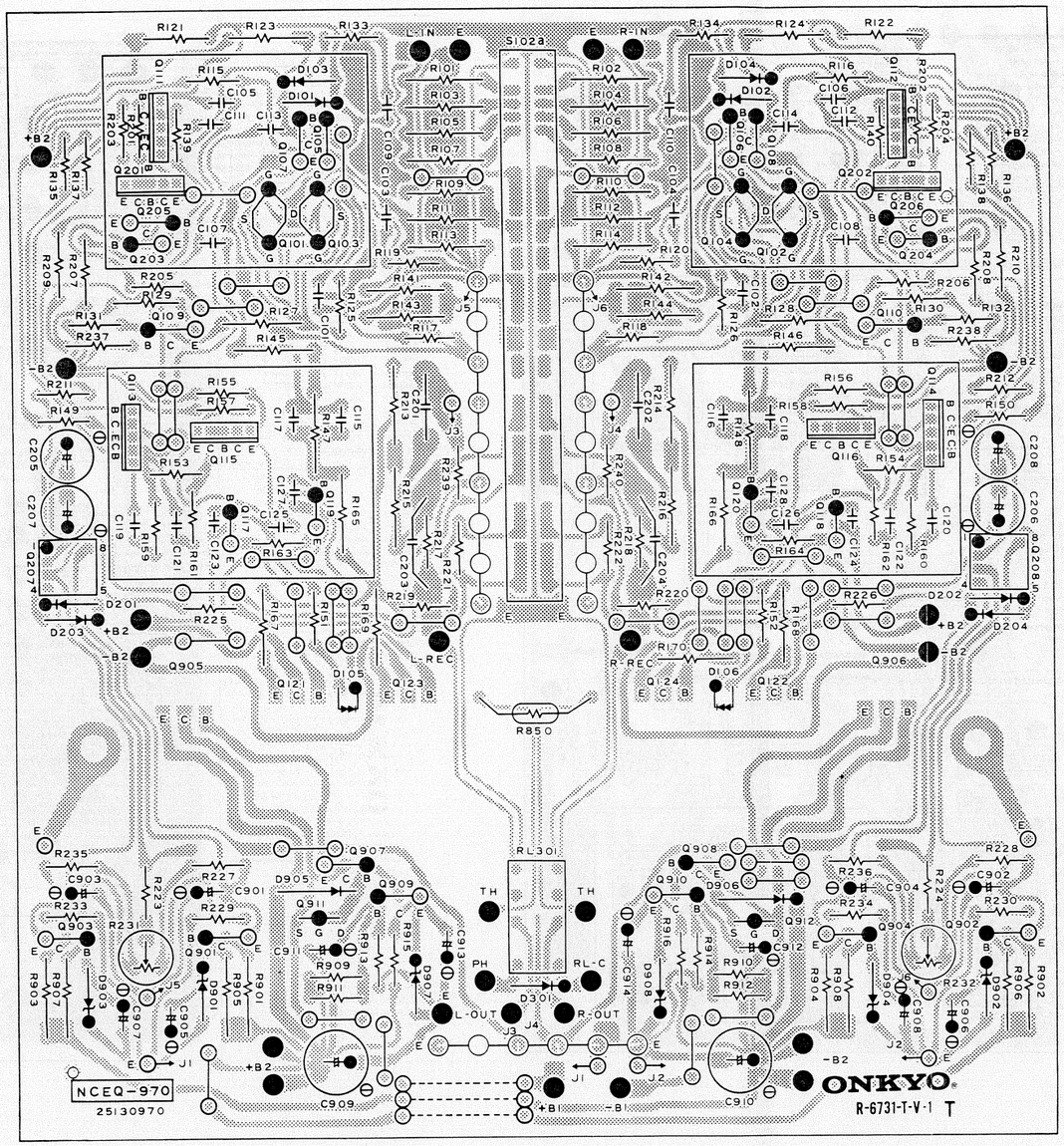
(ONE CHANNEL SHOWN)

NJM-4558

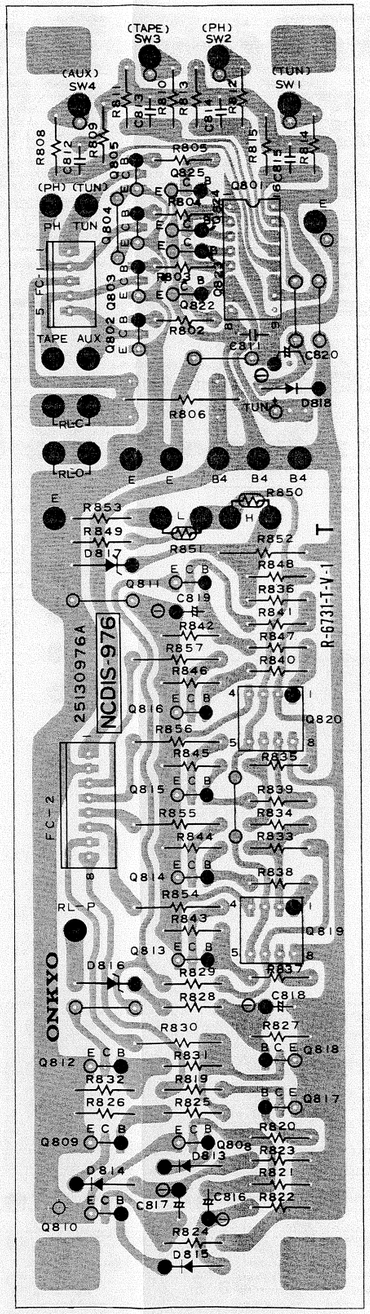


PRINTED CIRCUIT BOARD VIEW FROM COMPONENT SIDE

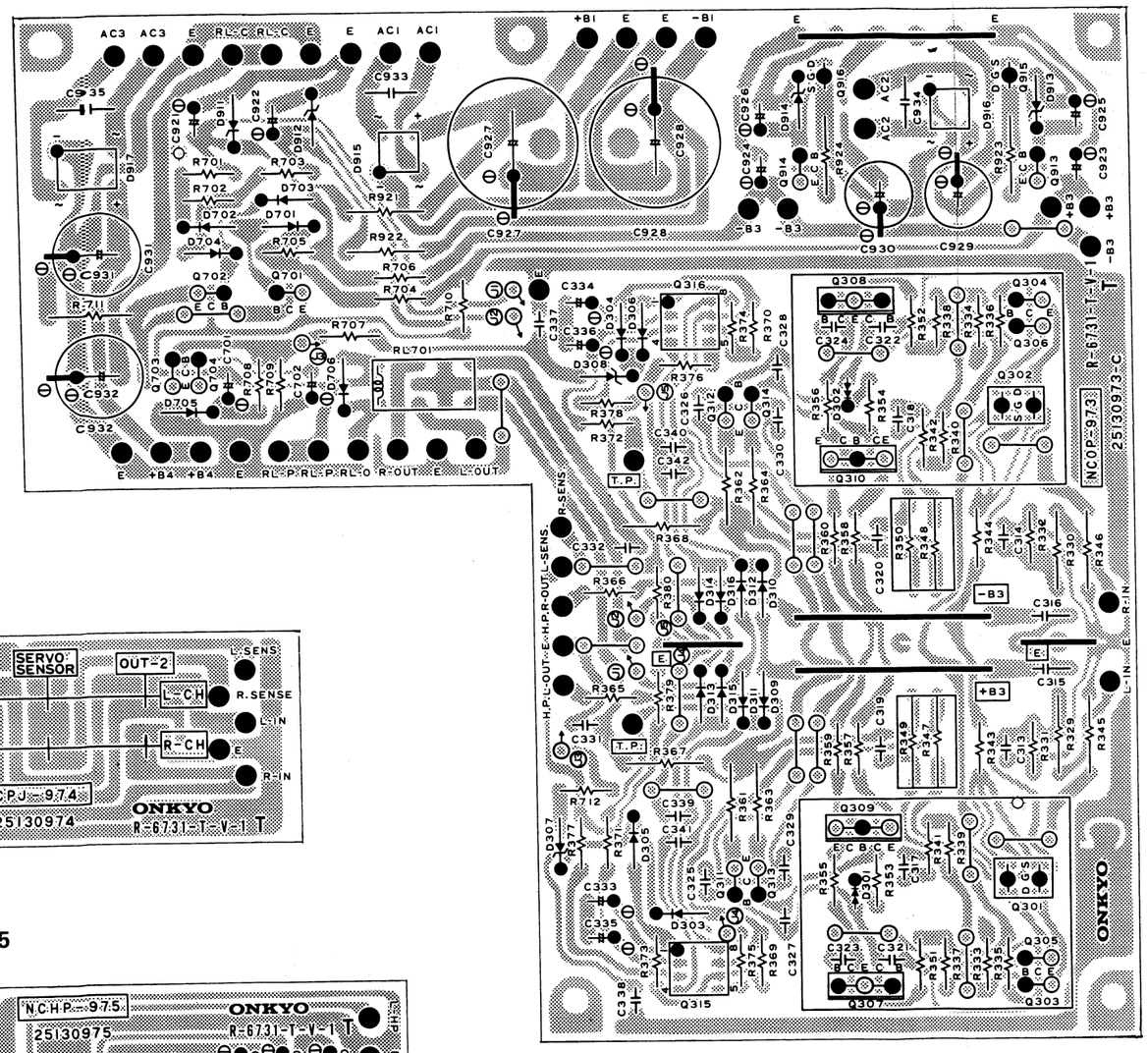
NAEQ-970



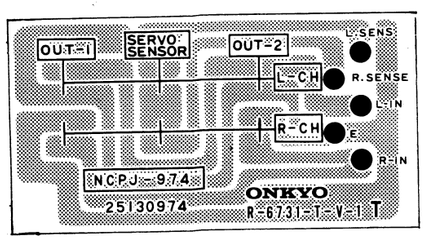
NADIS-976



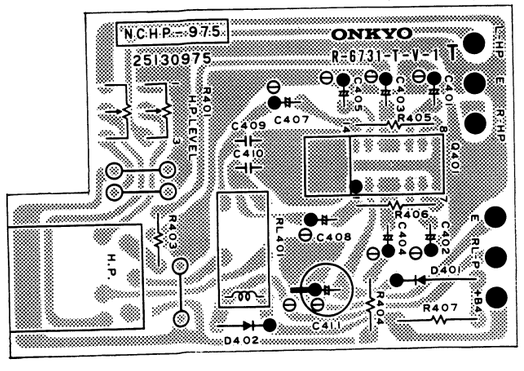
NAOP-973



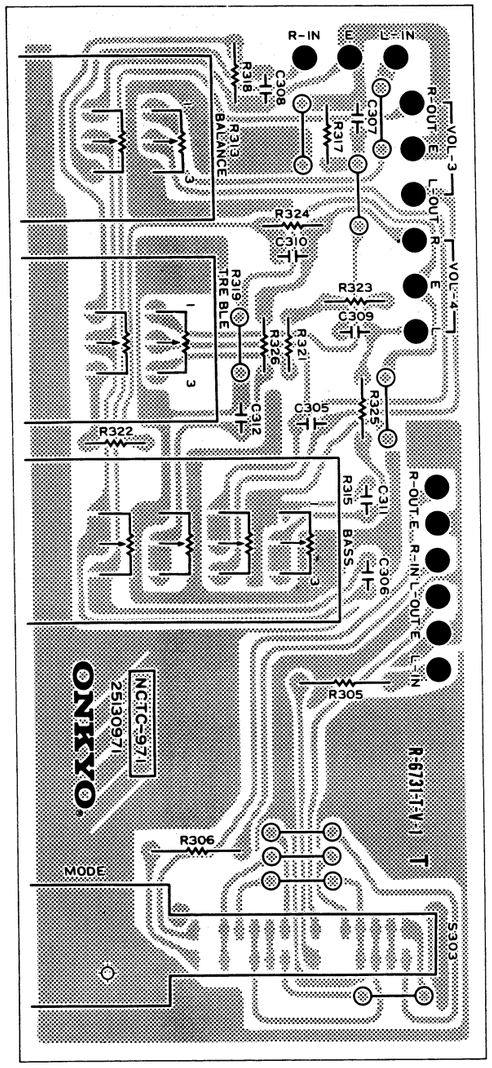
NAPJ-974



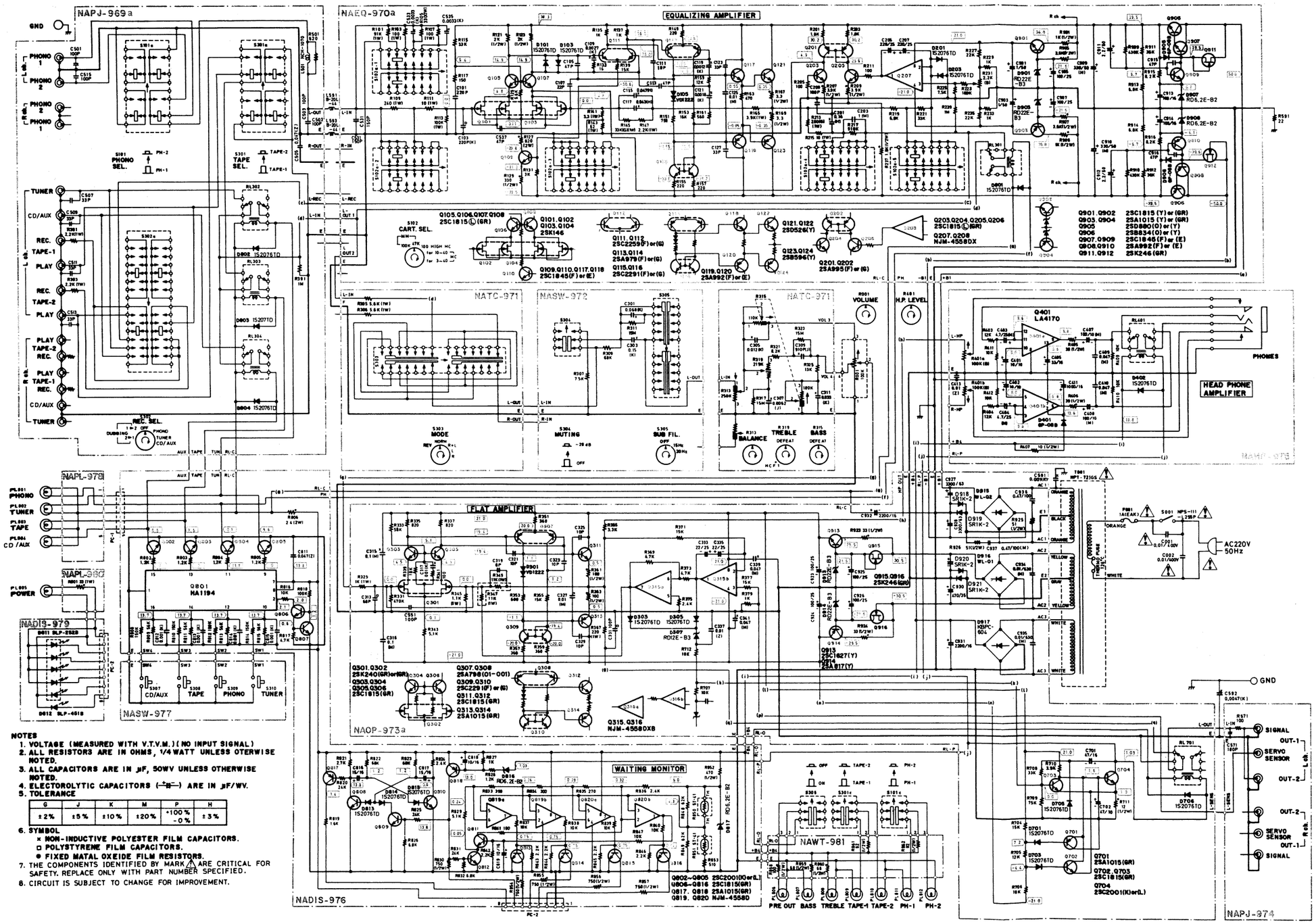
NAHP-975



NATC-971



SCHEMATIC DIAGRAM



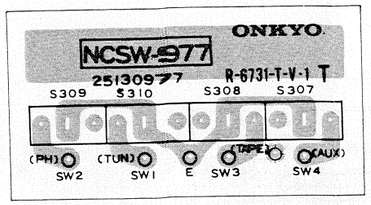
NOTES
1. VOLTAGE (MEASURED WITH V.T.V.M.)(NO INPUT SIGNAL)
2. ALL RESISTORS ARE IN OHMS, 1/4 WATT UNLESS OTERWISE NOTED.
3. ALL CAPACITORS ARE IN μF, 50WV UNLESS OTHERWISE NOTED.
4. ELECTRORLYTIC CAPACITORS (+ —) ARE IN μF/WV.
5. TOLERANCE

G	J	K	M	P	H
±2%	±5%	±10%	±20%	+100% -0%	±3%

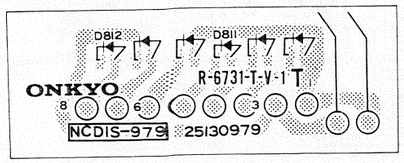
6. SYMBOL
   - × NON-INDUCTIVE POLYESTER FILM CAPACITORS.
   - □ POLYSTYRENE FILM CAPACITORS.
   - ● FIXED MATAL OXEIDE FILM RESISTORS.
7. THE COMPONENTS IDENTIFIED BY MARK ⚠ ARE CRITICAL FOR SAFETY. REPLACE ONLY WITH PART NUMBER SPECIFIED.
8. CIRCUIT IS SUBJECT TO CHANGE FOR IMPROVEMENT.

ONKYO CORPORATION

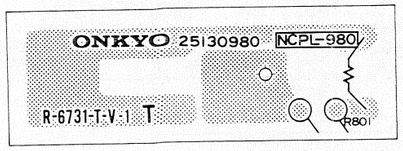
NASW-977



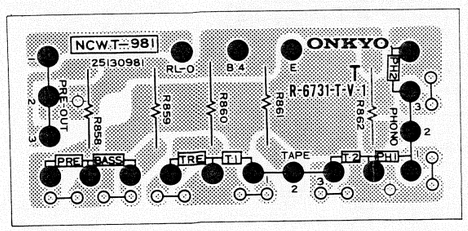
NADIS-979



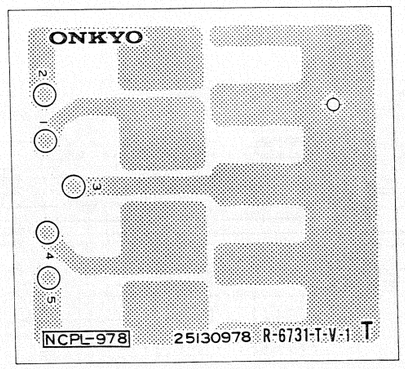
NAPL-980



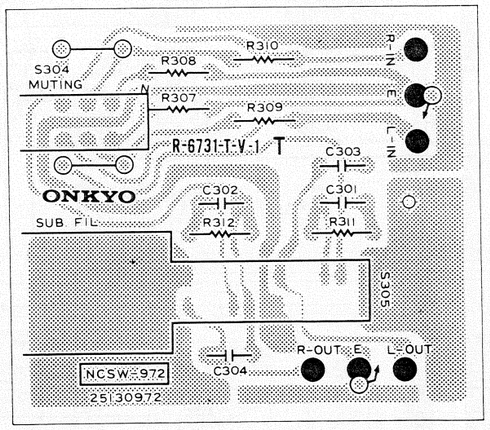
NAWT-981



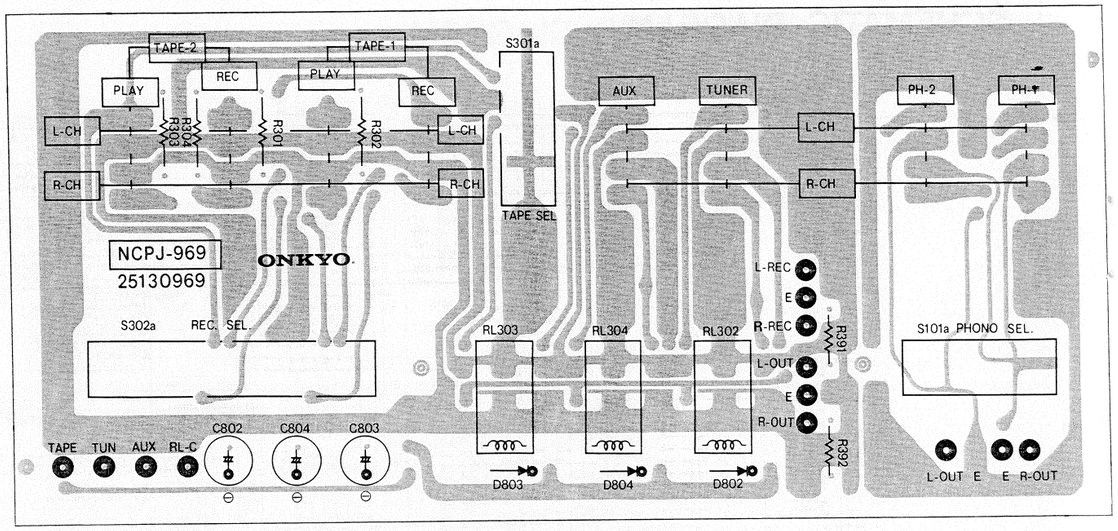
NAPL-978



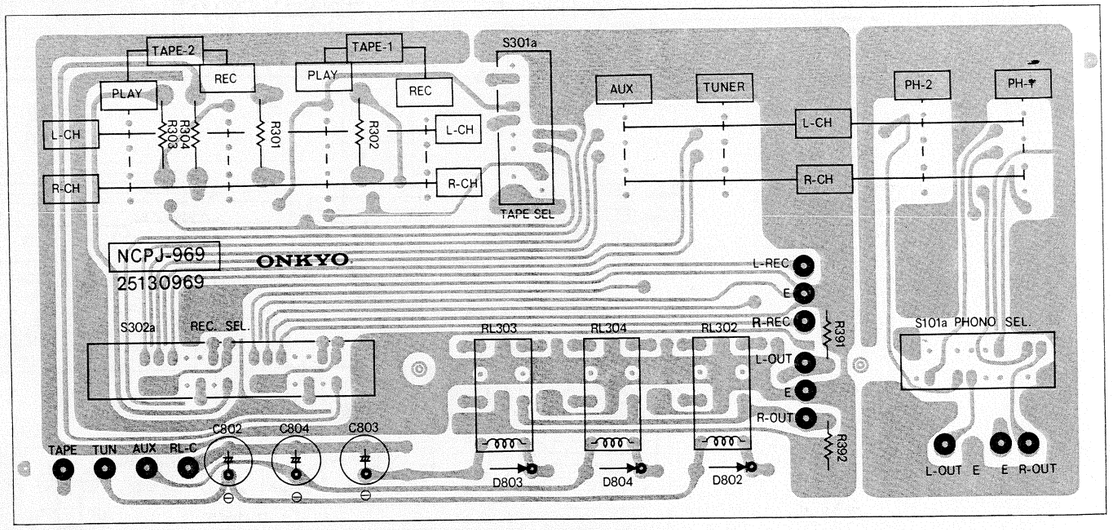
NASW-972



NAPJ-969(Conponent side)



NAPJ-969(Bottom side)



ONKYO DEUTSCHLAND GMBH. ELECTRONICS

8034 München-Germering, Industriestraisse 18, West Germany.
Telex: 521726 Telefon: (089)-84-9320

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